This listing of claims will replace all prior versions and listings of claims in this application:

a.) Listing of Claims

1.   (Currently Amended) A method for recording of structures in microscopy, comprising the following steps:

a)   acquiring an image and identifying a region of interest of a sample within the image and selecting a plane within the sample comprising the region of interest by a user;

b)   extracting the region of interest by means of image analysis and constructing a list of specimen positions;

c)   defining a list of possible further specimen positions derived from the list of specimen positions;

d)   selecting a sub-list of the possible further specimen positions that can be imaged in parallel by a microscope;

e)   traveling to a microscope position which makes possible acquisition of a scene in which all possible specimen positions of the sub-list are visible;

f)   performing a data acquisition;

g)   matching the sub-list of possible specimen positions to the acquired data, eliminating all possible specimen positions not belonging to the specimen, and storing the specimen positions belonging to the specimen;

h)   expanding the list of possible further specimen positions based on the specimen positions, found in g), belonging to the specimen;

i)   repeating steps e) through h) as long as the list of possible further specimen positions contains elements; and

j) b)   automatically recording the entire marked sample region in three dimensions.

2.   (Canceled)

3.   (Currently Amended) The method for microscopy as defined in claim 1 2,

wherein selection of the region of interest of the sample is accomplished using a

crosshairs that is overlaid on the image of the sample on a display.

4.   (Currently Amended) The method for microscopy as defined in claim 1 2,

wherein selection of the region of interest of the sample is accomplished by delimiting

the region of interest of the sample in the image of the sample displayed on a display.

5.   (Canceled)

6.   (Currently Amended) The method for microscopy as defined in claim 1 5,

wherein the list of specimen positions can be depicted as XYZ coordinates with reference

to a voxel grid.

7.   (Currently Amended) The method as defined in claim 1 5, wherein it comprises

the further steps of a)generating a new sub-list of test positions on the basis of the identified

specimen positions; b)incorporating the sub-list into the list of all hypothetical test

positions, excluding duplicate entries and positions already traveled to.

8.   (Original) The method as defined in claim 1, wherein the method for microscopy

is used in a scanning microscope.

9.   (Currently Amended) An arrangement for microscopy, comprising:

a microscope with at least one microscope objective, and a detector unit for

acquiring images of a sample;

a display for displaying the images of the sample acquired by the detector unit;

a computer system controlling the microscope and a data acquisition process, the

computer system comprising:

means for extracting a region of interest of the sample by image analysis

and for constructing a list of specimen positions;

means for defining a list of possible further specimen positions and

means for selecting a sub-list of possible further specimen positions that are

imaged in parallel fashion by the microscope;

means for traveling to a microscope position to make possible acquisition

of a scene in which all possible specimen positions of the sub-list are visible;

means for matching the sub-list of possible specimen positions to the acquired data;

means for eliminating all possible specimen positions not belonging to the specimen; and

a memory that stores the specimen positions belonging to the sample; a means for identifying ~~the~~ a region of interest of the sample, and

in the computer system a means for automatically recording ~~the~~ an entire marked sample region in three dimensions.

10.   (Original) The arrangement as defined in claim 9, wherein the means for automatically recording the entire marked sample region in three dimensions is a software module.

11.   (Original) The arrangement as defined in claim 9, wherein the means for automatically recording the entire marked sample region in three dimensions is embodied in the form of hardware and software.

12.   (Original) The arrangement as defined in claim 9, wherein the means for identifying the region of interest ~~encompasses~~ comprises a crosshairs and the crosshairs being overlaid on the image of the sample on the display.

13.   (Original) The arrangement as defined in claim 9, wherein the means for identifying the region of interest ~~encompasses~~ comprises a mouse cursor with which the region of interest of the sample can be delimited on the display.

14.   (Canceled)

15.   (Original) The arrangement as defined in Claim 9, wherein the microscope is a scanning microscope.